

# **APPLICATION FOR UNITED STATES PATENT**

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**Invention:** MULTI-FRONT FRONT CATCH PLATE DESIGN FOR VARIOUS MULTI-COMPONENT CARTRIDGES

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5                   **MULTI-FRONT FRONT CATCH PLATE DESIGN FOR VARIOUS MULTI-  
COMPONENT CARTRIDGES**

BACKGROUND OF THE INVENTION

                  1. Field of the invention

10           The present invention relates to dual-component caulking guns (such as for epoxy and resin)  
and, more particularly, to a universal manual, pneumatic or battery power-operated caulking gun for use  
with a variety of differently-sized dual component cartridges.

                  2. Description of the Background

15           There are a wide variety of caulking guns that are used to dispense many types of fluid  
compositions such as urethane, vinyl, polyester, epoxy and other plastics. Conventional caulking guns  
have a barrel or carriage which seats a cartridge containing the fluid composition, the cartridge having a  
dispensing nozzle at one end. These caulking guns typically have a plunger shaft that is driven by a  
trigger either manually or by battery or pneumatic power. A piston is mounted at the end of the plunger  
20   shaft, and operation of the trigger moves the plunger shaft and piston through the cartridge to urge  
compound there from.

                  In some cases, such caulking guns are adapted for use with a double cartridge for dispensing  
two-component chemical systems such as epoxy, sealant, and adhesive dispensers, which are used in  
automotive, concrete, and other industrial bonding applications where structural integrity is highly  
25   demanded. Unfortunately, there currently is no packaging standard for double cartridges. The  
cartridges and, especially, the neck of the cartridges come in different shapes, forms, and sizes,

5 depending on the manufacturer. Thus, manufacturers typically sell their own dedicated dispensing gun for their own double-cartridge products. Due to the variety of cartridges, there is no universal dispensing gun or dispensing tool. Consequently, users need to inventory several dedicated tools to use a variety of the commercially available dual cartridge dispensers.

A few prior efforts have been directed toward solving this problem. For example, U.S. Patent  
10 No. 6,464,109 to Harris issued October 15, 2002 discloses a caulking gun with a mechanism for positioning and securing the variously shaped- and sized-necks of a wide variety of cartridges utilizing a threaded rod and thread-bored stop which can be positioned to apply pressure to the nozzle end of the cartridge, thus securing the nozzle in place. However, Harris '109 does not teach a method or mechanism for securing dual cartridges.

15 Also of interest is U.S. Patent Application Publication No. U.S. 2002/0145015 to Nelson published on October 10, 2002. The Nelson publication discloses a caulking gun carriage that is adjustable to accommodate one, two, or more cartridges. Nelson includes one potential configuration for the nozzle end of the gun carriage (see Figs. 1-8 therein), but it does not teach a mechanism or method for securing multiple cartridges with differing neck shapes and sizes.

20 U.S. Patent No. 6,527,203 to Hurray et al. issued March 4, 2003 teaches a two-component dispensing gun that receives two separate cartridge nozzles and dispenses one flow of mixed fluid. Hurray et al. '203 does not teach a mechanism capable of accommodating necks of different shapes and sizes.

5           It would be greatly advantageous to provide a dual-cartridge type gun that can accommodate  
and secure a range of the various-sized commercially available dual-compound cartridges and that  
exhibit varying neck shapes and sizes. U.S. Patent Nos. 5,197,635 and 6,290,101 to the inventor  
herein and issued on March 30, 1993 and September 18, 2001, respectively, teach a dual-cartridge  
type dispenser gun that can accommodate various-sized commercially available dual-compound  
10 cartridges, and a means to secure the various dual cartridges in place despite fixed-size carriages.  
Unfortunately, neither patent teaches a mechanism for securing different shaped and sized necks in place  
for accurate application.

Consequently, there remains a need for a dual-cartridge dispensing gun that includes a  
mechanism for exposing and securing various sized and shaped cartridge necks without having to touch,  
adjust, change or remove the securing components for any reason.

#### SUMMARY OF THE INVENTION

It is, therefore, an object of the present invention to provide a dual-cartridge dispensing gun  
having a universal front front catch plate to accommodate various sizes and shapes of cartridge necks of  
the dual-cartridge format. The universal front front catch plate may be used in conjunction with U.S.  
Patent No. 6,290,101 Cartridge Stabilizing Plate for Dual Barrel Dispensers and U.S. Patent No.  
5,197,635 Variable Thrust Caulk Dispensing Device to give a truly adaptable dual-cartridge dispensing  
gun.

It is another object to provide a front front catch plate as described above that accommodates a range of different cartridge neck shapes and sizes, thereby avoiding the need to change dispensing guns each time that the size or shape of the nozzle of the cartridge(s) changes.

It is a further object to provide a front front catch plate as described above that can be economically manufactured and installed onto a single or dual-cartridge dispensing gun using a minimum of time and materials.

According to the present invention, the above-described and other objects are accomplished by providing a front catch plate for a dual-cartridge dispensing gun of the type for extruding compound from both cartridges of a variety of sizes of dual cartridge packs. The front catch plate fixes to the neck of the application end of the carriage and provides an opening capable of exposing and securing any size and shape of neck for single or dual-cartridge applications. The front catch plate is capable of accommodating a range of different cartridge neck sizes, thereby avoiding the need to switch dispensing guns each time that a cartridge with a different sized or shaped neck is used.

In one embodiment, the front catch plate is formed with an upwardly-directed yoke that secures the cartridge neck, leaving the protruding cartridge nozzle exposed. Each cartridge or set of commercially available dual cartridges has a corresponding plastic insert associated with it. The plastic insert slides down into the yoke of the front catch plate and provides the proper shape for securing the cartridge neck in place and aligning the nozzles to provide accurate application of the compound. The cartridge neck slides down upon the appropriate insert and is thus secured for use.

In a second embodiment, the front catch plate is formed in an elongated 'C' shape, with a laterally-oriented yoke. The yoke has a multi-grooved edge for slidable insertion of plastic inserts to adapt to a variety of cartridge neck forms, shapes and sizes. A plastic insert is then slid into the yoke until it pushes against the neck of the cartridge, thus securing the cartridge in place for use. The lateral yoke allows for lateral, or side, loading of the cartridge.

Both front catch plate embodiments can be adapted to accommodate a range of different cartridge sizes, requiring only the proper plastic insert be installed onto the front catch plate before use. Moreover, the front catch plate can be economically manufactured of metal or molded plastic or other appropriate material and installed onto a single or dual-barrel dispensing gun at minimal additional cost of time and materials. Additionally, both embodiments may be used in conjunction with the stabilizing plate taught in U.S. Patents Nos. 6,290,101 and 5,197,635 to the inventor herein to provide a truly adaptable dispensing gun.

#### BRIEF DESCRIPTION OF THE DRAWINGS

Other objects, features, and advantages of the present invention will become more apparent from the following detailed description of the preferred embodiment and certain modifications thereof when taken together with the accompanying drawings in which:

FIG. 1 is a front perspective view of a dual-cartridge dispensing gun incorporating a top-loading front catch plate 5 according to one embodiment of the present invention.

FIGs. 2 and 3 are a front perspective view, and front view, respectively, of a dual-cartridge dispensing gun incorporating a side-loading front catch plate 11 according to a second embodiment of the invention.

FIG. 4 is a back view of the side-loading front catch plate 11 equipped with an adjustable centering stop 15.

FIGs. 5 and 6 are front views of two alternative plastic inserts 3 with different cradle 16 configurations.

FIGs. 7 and 8 are a front and side perspective view, respectively, of yet another plastic insert 3 for the top-loading front catch plate 5 of FIG. 1.

FIGs. 9A-C are a perspective view, side view and top view, respectively, of the adjustable centering stop 15.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The basic design concept embodied in the present invention is a front catch plate for a dispensing gun that accommodates any form, shape or size dual cartridge neck, and secures said cartridges for application of the contained compound.

FIG. 1 is a front perspective view of a dual-cartridge dispensing gun incorporating a top-loading front catch plate 5 according to one embodiment of the present invention. The top-loading front catch plate 5 is generally U-shaped to define an upwardly directed yoke for receiving the neck 4 of a dual-cartridge 1, leaving the protruding cartridge nozzle 2 exposed.

FIGs. 2 and 3 are a front perspective view, and front view, respectively, of a dual-cartridge dispensing gun incorporating a side-loading front catch plate 11 according to a second embodiment of the invention. The side-loading front catch plate 11 is similar to that of FIG. 1, but is generally C-shaped to define a laterally-accessible yoke for receiving the neck 4 of the dual-cartridge 1, leaving the protruding cartridge nozzle 2 exposed.

In either embodiment the front catch plate 5, 11 may be economically formed of molded plastic or metal, although machined metal or other durable materials are also acceptable. The front catch plates 5, 11 may be installed during the original manufacture of the gun, or may be distributed separately as a retrofit part. If installed as a retrofit part, the catch plates 5, 11 are installed simply by screwing them onto the application end of the dispensing gun through threaded screw holes 9 (see FIG. 2).

The yokes of both top- and side-loading front catch plates 5, 11 are defined by a tongue-and-groove track or "channeled edge 12" around its periphery. It is this channeled-edge 12 as seen in FIG. 3 that seats the neck 4 of the dual-cartridge 1. Thus, if the neck 4 fits the yoke 5, 11 as is, the neck 4 slides securely into the yoke 5, 11. On the other hand, both top- and side-loading front catch plates 5, 11 are adapted to accept a variety of plastic inserts 3 by which they are able to accommodate virtually any commercially available form, shape and size of dual caulk cartridge. Each odd-sized commercially-available dual caulk cartridge will have an associated plastic insert 3, the interior configuration of the insert 3 specifically conforming to that particular dual caulk cartridge. The exterior configuration of the inserts 3 are all uniformly configured to mate with the channeled-edges 12 of the front catch plates 5,



11. Each plastic insert 3 has a peripheral locking channel 14 that cooperates with the channeled-edge 12 of catch plates 5, 11.

FIGs. 5 and 6 are front views of two alternative plastic inserts 3 for the top-loading front catch plate 5 of FIG. 1, including two different cradle sections 16 that conform to the neck 4 of the cartridge to be used. The inserts may be molded with any variety of cradle 16 configurations as needed, depending on the neck 4 configuration of the dual cartridge to be employed.

FIGs. 7 and 8 are a front and side perspective view, respectively, of another exemplary plastic insert 3 for the top-loading front catch plate 5 of FIG. 1, showing the peripheral locking channel 14 that cooperates with the channeled-edge 12 of catch plate 5, and cradle section 16 that conforms to the neck 4 of the cartridge to be used. In operation, the proper plastic insert 3 is slid down onto the channeled-edge 12 of the top-loading front catch plate 5, and then the cartridge neck 4 is then seated thereon. The cooperating channeled-edge 12 and locking channel 14 secures the plastic insert 3 onto the top-loading front catch plate 5. The dual cartridges 1 are seated in the barrels 6 and are ready for application.

Operation of the side-loading front catch plate 11 (FIGs. 2, 3, and 4) is substantially the same as described above except from a lateral orientation. In addition, the side-loading front catch plate 11 is preferably equipped with an adjustable centering stop 15 (FIG. 4). The adjustable centering stop 15 is illustrated in FIGs. 9A-C, which are a perspective view, side view and top view, respectively. The adjustable centering stop 15 generally comprises a slidable clip with opposing gripping tabs 17 and a support block 19. The tabs 17 of the adjustable centering stop 15 are pressed outwardly, as indicated

by the 'A' arrows, to allow the stop 15 to be slid onto the side-loading front catch plate 11. The tabs 17 are then released, which causes pressure to be applied, in turn causing the adjustable centering stop 15 to remain in place. The adjustable centering stop 15 may be slidably adjusted within the yoke of the side-loading front catch plate end 11, causing support block 19 to bear against and center the cartridge neck 4 as needed. In this way the adjustable centering stop 15 holds the cartridge neck 4, selectively centers it, and thus the dual cartridges 1 in place for application.

It should be readily understood that both of the above-described front catch plates 5, 11 secure a variety of cartridge necks 4 and thereby facilitate accurate application of compound such as epoxy or the like. The front catch plates 5, 11 also accommodate the various form, shape and size of neck of commercially available dual cartridges. Moreover, the front catch plates 5, 11 can be economically manufactured of metal or molded plastic and installed onto a dual barrel dispensing gun at minimal additional cost of time and materials, and they can be used in conjunction with all of manual, pneumatic or battery power-operated caulking guns.

Having now fully set forth the preferred embodiments and certain modifications of the concept underlying the present invention, various other embodiments as well as certain variations and modifications of the embodiments herein shown and described will obviously occur to those skilled in the art upon becoming familiar with said underlying concept. It is to be understood, therefore, that the invention may be practiced otherwise than as specifically set forth herein.